

Abstract

The main objectives of this research project were (1) to select and improve the F₂ Native × Pietrain (RPP 2) and the F₂ Native × Meishan crossbred pigs (RPM 2) for suitable production in the highland region and (2) to examine and develop the use of local feed materials in suitable diet for crossbred pigs. This research project was divided into three experiments. In experiment 1, in mother line, RPM boars were used to breed with RPM females to produce the F₁ generation (RPM 1) that results from the 2015 experiment. Similarly, in father line, male RPP pigs were used to mate with RPP females to produce the F₁ generation (RPP 1) that results from the 2015 experiment. After line breeding has been practiced for two generations, the RPP 2 boars and the RPM 2 gilts were selected to breed in cross breeding. After initial selection of swine breeding stock, a total of number of six RPP 2 boars and two RPM 2 gilts were kept for breeding stock. In experiment 2, the experimental design was divided in two sub-experiments as follows. In experiment 2.1, the RPM 2 (n=24) and the RPP 2 (n=24) pigs were used in 2 × 2 factorial design arrangement. This experiment was divided in two periods: during 20 to 40 kg and 40 to 60 kg of body weight. During 20 to 40 kg of body weight, there are two main factors: two crude protein (CP) levels (15 and 16%) and two metabolizable energy (ME) levels (2.5 and 2.8 Kcal/g). During 40 to 60 kg of body weight, there are two main factors: two CP levels (13 and 14%) and two ME levels (2.5 and 2.8 Kcal/g). For the RPM 2 pigs, during 20 to 40 kg of body weight, there was an interaction (P<0.05) between ME and CP for average daily gain (ADG) and number of days to reach 40 kg live weight. Moreover, the RPM 2 pigs that fed 2.5 Kcal ME/g and 16% CP demonstrated a higher ADG and shortest number of days. During 40 to 60 kg of body weight, there was an interaction (P<0.05) between CP and ME for weight gain. The ADG was greater in 2.5 Kcal ME/g and CP 14% group compared with 2.5 Kcal ME/g and CP 13% group but was not different when compared with 2.8 Kcal ME/g and CP 13% and 2.8 Kcal ME/g and CP 14% groups. For the RPP 2 pigs, during 20 to 40 kg of body weight, there was an interaction (P<0.05) between CP and ME for weight gain. The weight gain was greater in 2.8 Kcal ME/g and CP 16% group compared with other group (P<0.05). No interaction was observed between ME and CP level for ADG, number of days to reach 40 kg live weight, feed intake, FCR and FCG. No interaction was observed between ME and CP level for body weight ADG, number of days to reach 60 kg live weight, feed intake, FCR and FCG. The CP had effect on ADG (P<0.05). Moreover, the ADG was greater in CP 14% and 2.8 Kcal ME/g group compared with other group (P<0.05). In experiment 2.2, weaned RPM 2 pigs (n=18) and RPP 2 pigs were randomly divided into three groups of dietary treatment under a completely randomized design (CRD) as follows. Group 1, pigs were fed a best diet from

experiment 2.1 (control group). Group 2, pigs were fed a best diet from experiment 2.1 with vegetables residue. Group 3, pigs were fed a best diet from experiment 2.1 with fermented plant (yeast fermented corn meal). For the RPM 2 pigs (during 20-40 kg of body weight), animals that were fed a best diet from experiment 2.1 (16% CP and ME 2.5 Kcal/g) had greater ($P>0.05$) weight gain and ADG than animals that were fed control diet with fermented plant or vegetables residue, respectively (20.44 vs. 19.57 vs. 18.18 kg for weight gain and 0.68 vs. 0.63 vs. 0.48 kg/day for AGD). The RPM 2 pigs that were fed a control diet with vegetables residue had a higher FCR ($P<0.05$) than pigs that were fed a control diet with fermented plant or only a control diet, respectively (3.13 vs. 2.95 vs. 2.53). Although, the growth performances of the RPM 2 pigs during 40-60 kg of body weight did not differ among dietary treatments, ADG tended to be high in pigs that were fed only a control diet (14% CP and ME 2.5 Kcal/g) than in a control diet with fermented plant and a control diet with vegetables residue (0.68 vs. 0.55 vs. 0.52 kg/day, respectively). Nevertheless, the growth performances of the RPM 2 pigs did not differ among dietary treatments, the RPP 2 pigs that were fed only a control diet (CP 16% and ME 2.8 Kcal/g) tended to have a greater in ADG (0.83 kg/day) in comparison with pigs that were fed a control diet with fermented plant (0.72 kg/day), and a control diet with vegetables residue (0.54 kg/day). Moreover, the FCR of RPP 2 pigs tended to be high in group that received a control diet with vegetables residue (2.89) than in group that received a control diet with fermented plant (2.76) and only a control diet (2.62). In experiment 3, the F_2 crossbred piglets (RPM 2 and RPP 2) were used to prove for swine production following the guideline for good animal production (GAP) in different levels of highs in highland area: < 800 m and > 800 m above sea level. At < 800 m above sea level, fifteen weaned piglets have been sent to Nong Hoi and Nong Khiew Royal Project Development Centers. At > 800 m above sea level, twelve weaned piglets have been sent to Mae Pun Luang and Mae Lod Royal Project Development Centers. Additionally, in other areas, eighty six weaned piglets have been sent to Mae Sam Laep and Sop-Moei Royal Project Development Centers. Therefore, these data demonstrated that optimal levels of protein and energy in diet should be promoted for smallholder farmer in the highland region to produce crossbred pigs.

Key words: Swine, Native crossbred pig, Pietrain, Meishan, Production performance, Highland